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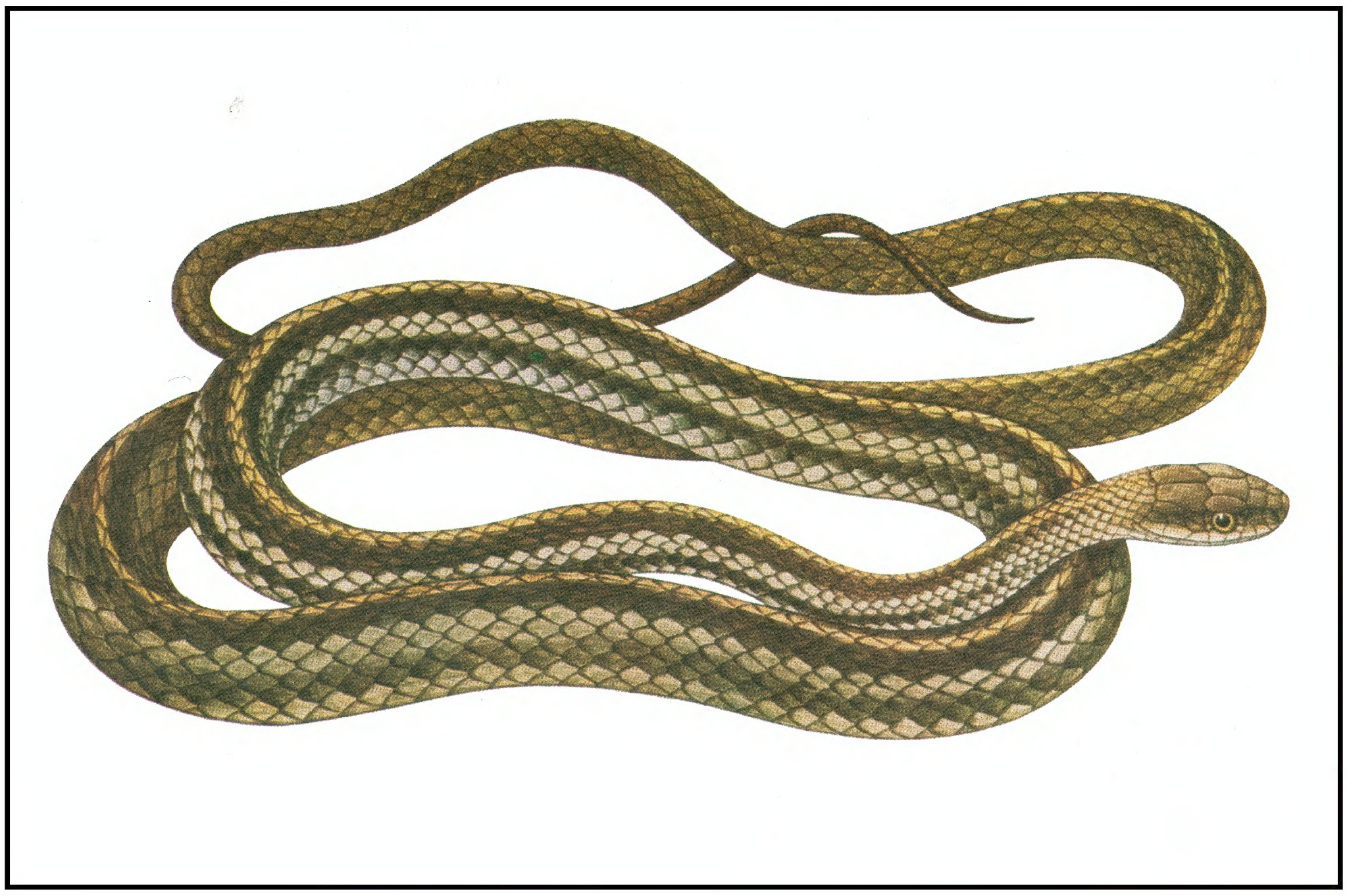

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Cover: Black-bordered ratsnake, *Ptyas nigromarginata*. Drawing (as *Zaocys nigromarginatus oshimai*) from *A Monograph of the Snakes of Japan* by Moichiro Maki, 1931.

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Observation of Tree Climbing by Sonora Mud Turtles (*Kinosternon sonoriense*), and The Creation Story behind a Famous Dr. Seuss Turtle Tale

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A few years back, I had a column dealing with Sonora Mud Turtles (*Kinosternon sonoriense*) [KISO, for short] developing inside my head. I had a great behavioral story about wild, free-ranging KISO to lead off with. Great stories about mud turtles doing anything but stinking to high heaven seem to be rare. Where I went wrong with my one great story about KISO was in taking the time to discuss it with one of the two other people who witnessed the behavior. The witness I ignored was my very first Arizona herp buddy, Dennis Caldwell. He has taken to denying everything I say of late, even on those occasions when it is true. I instead went with my very second Arizona herp buddy, one Don Swann. Normally, Don doesn't remember *anything*. This fact usually makes him the ideal witness. Ideal witnesses are hard to come by, as witnesses can be bothersome in their contradictory and contrarian ways. But that was never a problem with Don. By bringing him into my understanding of what happened with these particular KISO, I would be able to pull in a somewhat credible witness who would merely shrug and say "I have no remembrance of that happening."

With this in mind, I drafted an email to Don with my take on something that he, Dennis and I witnessed back during one of our earliest outings together. Since I was with aquatic herpers on this day, we were performing great feats in aquatic herping together. The first paragraph of my email to Don rudely dealt with his forgetful nature. I basically told him it was stupid of me to consult him, since I was *sure* that he would not remember any of the event that I was about to relay to him. While the second paragraph was much kinder, I still found a way to nick his bad memory in it. In any case, assured that the observation in question (and thus, a subsequent article) was in the bag, I sent Don the following:

Subject: Good old days with mud turtles
Hi Don, 7 December 2021
I am doing my next column for the CHS on *Kinosternon sonoriense,* which I will shorten to KISO both in the column and here. You taught me how to look for KISO. I don't know how long it would have taken me to learn to sneak up on a pond and use binoculars to spot them, but it for sure would have been after 26 September 1992. Dennis, you and I were in Redington Pass that day. When you showed me your technique, I felt as if a whole new world opened up for me. I'm reasonably sure that you don't remember one lick of that day, so let me tell you a couple things about it. The place you taught me was a pond on the south side of the main drag. Working that pond together, side by side, we picked off seven Black-necked Gartersnakes. I'm told that drought took that pond out, and I believe it! But the coolest sighting that day was at another pond; how I yearn to check that place out again. But the drive in alone would do me in.

Anyway, at this pond, there was a slender-trunked tree that angled out of an embankment at about a 45-degree angle. The trunk of this tree was maybe 8 inches in diameter, and grew in such fashion as to be over the surface of the pond. About 30 feet up this trunk is where the canopy for the tree started. From the embankment that the trunk grew out of, to the canopy, was lined with a BUNCH of KISO -- perhaps as many as 50. The three of us snuck up on this tree (I don't remember what kind of tree it was), and since Dennis was the only one with a telephoto lens, we let him take the shot. As soon as he stuck that camera body around the boulder we were hiding behind, the KISO saw it, and they all plunged off that tree and into the water. It was quite the spectacle! By the time we left that pond, they were starting to climb the tree again. Man -- I'd kill to have an image of those KISO doing this. Before they all plunged into the water, I noticed that the largest ones were the ones higher up the tree. I can almost imagine that the topmost positions are "earned." A younger, smaller turtle attempting to take the top would likely result in it getting shoved into the drink!

We are back to live action again. Rapid responses from Don are rare, but he brought it all back quickly with his own, less-than-desirable input to my account. This is what he had to say:

Re: Good old days with mud turtles (7 December 2021).
Well, Roger, I don't remember much, but I definitely remember that day as if it was yesterday. I've never seen anything quite like those turtles in the tree, dropping like

Sonora Mud Turtles (*Kinosternon sonoriense*) basking. Note the large size of the dominant topmost turtle. H-m-m-m. Image by Martin J Feldner, 12 August 2017, Pima County Arizona

stones into the water below. I'm not sure your memory of the big ones higher up is true, though—I think you are mixing it up with a book I read once—I think it was a treatise on turtles named Yertle.

Thus endeth round one of my trying to make a column of this story. I'm not sure what exactly I would have done with it even if Don agreed with everything I said. I can think of several snappy titles to such a column, but my favorite was going to be: "Take the high ground: Size-related dominance of basking postures in tree-climbing Sonora Mud Turtles (*Kinosternon sonoriense*)." At least a dozen people would have read such an article. Fame was around the corner, but no! Not only did my witness *not* collaborate my "KISO king of the hill" aspect of this story, he even went so far as to accuse me of plagiarism with this Yertle business of his. The first issue—the loss of sky-high-basking-whopper-KISOs—can be passed off as improper witness tampering on my part. No big deal, I pissed the guy off, and he put the kabong on my story. But to accuse me of trying to steal from the works of *who*? That was too much! I cooled off for 11 days, and broached the subject again:

12/18/2021 Subject: Yertle (SP?) the Turtle
Hi Don,
In a recent email exchange, you suggested that I may have gotten the idea of larger KISO occupying the top echelon of a tree from the Dr. Seuss classic mentioned in the subject box. I have heard of the book, but never read it. I have requested a copy in my recent communique to Santa's most efficacious elf, and expect to receive it for Christmas. I look forward to reading it. That's about my speed these days. But if it goes over my head, I may ask for explanations.

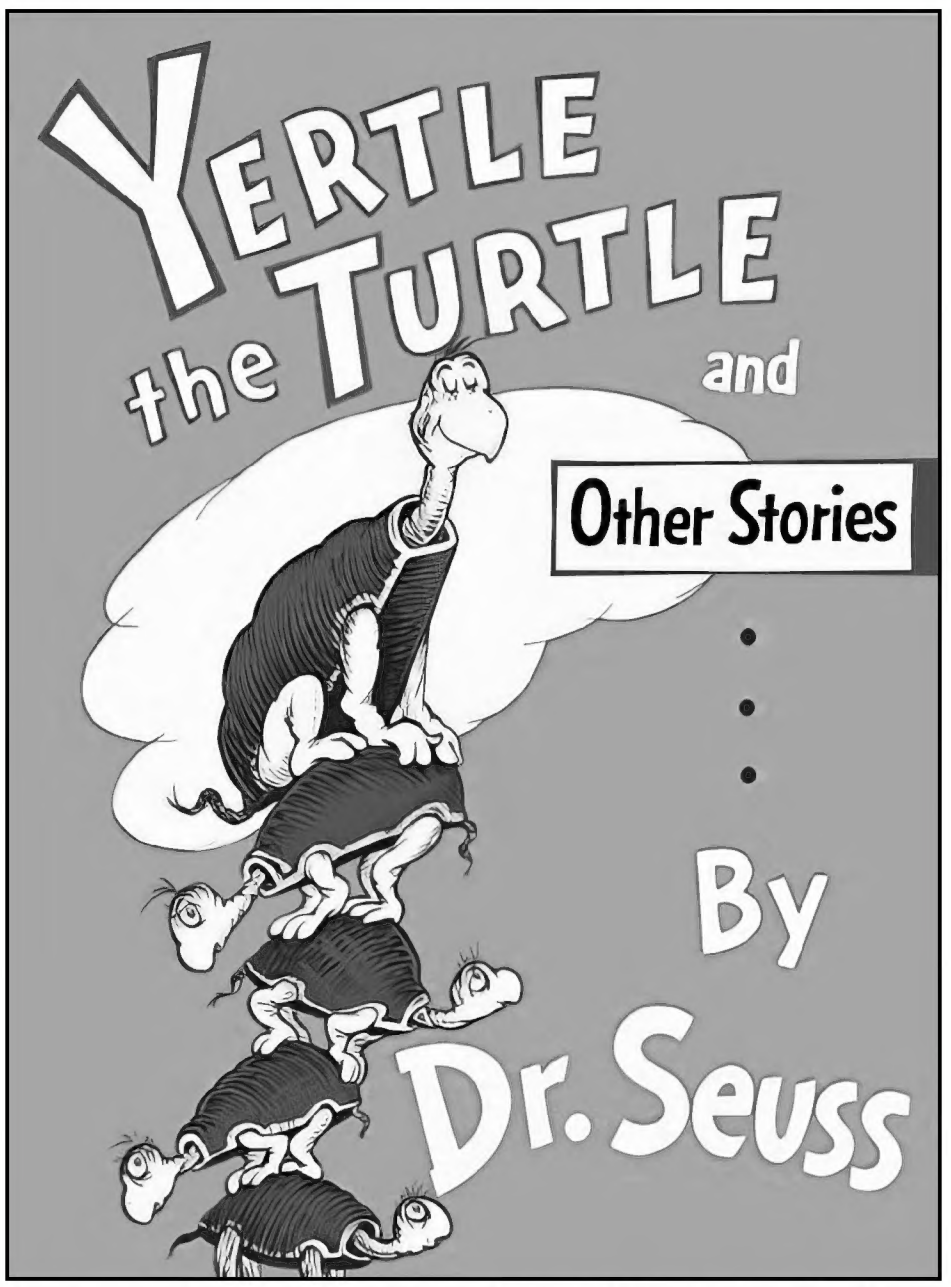
12/20/2021 Re: Yertle (SP?) the Turtle
You will truly be a complete person when you have at last read this book. – Don

I'm all done with emails now. We are no longer discussing embellishments that have been shot down; we are discussing fact. The fact is that on 26 September 1992, three of us saw 50 tree-climbing KISO who were basking as high as 30 feet above the water start high-diving into their pond like it was raining mud turtles. Ker-splash, plip, plop, plippity plop, ploppity plip and so on for maybe 20 seconds. In nearly 40 years of observing them, it is my most unusual KISO observation ever—period. We're done with that. We are now talking about:

Yertle the Turtle

For the sake of clarity, I share a picture of my best Christmas present for 2021. This is the book I'm talking about, ok? I'm sure the image of the cover is sufficient for me to continue without citing the work. When two old friends talk, good things happen. Without Don Swann, I may have never feasted my eyes on its contents. Am I correct in thinking that I may be the only herpetologist here who made it to 67 years of age before reading *Yertle the Turtle*? The rest of you know the story, right? Well, guess what? I didn't! It was all new to me.

For those of you have read it, but forgotten some of the details, I provide a brief review. We start with Yertle himself. His unusual name is likely Slavic in origin, but details of Yertle's lineage are lacking. This reflects a bit of shoddy research on the part of the author, for Yertle is a king. Whoever heard of a king without a bunch of begats appearing before his name? Moving along, we learn that Yertle is king of his pond in Sala-ma-sond. Said Sala-ma-sond pond is described as clean and warm, and the waters contain plenty of food for Yertle and his subjects. There is but one basking rock in the whole pond, and Yertle has it all to himself. It's good to be the king! The day comes when King Yertle is no longer satisfied with the view from his throne on a stone, and commands nine of his subjects to pile on top of each other. He then clambers to the top of his vertically-piled subjects, and is delighted to see his perception of the world—and his kingdom—grow to include a pasture, a cow, a horse, a kitty cat and a mulberry bush. King Yertle is so pleased with his new view that he sits up there for hours. This eventually brings about some grousing from Mack, the anchor turtle at the bottom of the stack. King Yertle abruptly tells him to "nut up," and commands 200 more turtles to pile on. The king's subjects scramble to oblige, and Yertle clambers to the top of them. Now Yertle can see for over 40 miles and proclaims himself lord of all he surveys. He stays up top until nightfall. The moon rises above him, and King Yertle is both verklempt and surly about the moon being above his lofty perch. His Royal Highneyass morphs into His Royal Painintheass, and commands that his stone throne stack-up be piled taller than the moon. As a result of his command, exactly five thousand six hundred and seven of his subjects rally to the cause. Apparently, according to kingly chelonian calculations, that was how many turtles were needed to get King Yertle above the moon. It's a turtle math



Fairy tale? Or factual account of the patriarch of the Mud Turtle clade? The author suggests the latter.

thing that King Yertle whipped up. They pile up, King Yertle piles on, and poor bottom anchor Mack the chronic bitcher rips out a calamitous belch. The belch sends tremors up the column of stacked turtles. These tremors increase exponentially as they rise up the stack, reaching downright seismic proportions directly under King Yertle the Turtle's royal keister. He is shaken from his moorings at the top of the stack, nose-dives the distance of 5,607 (plus the original nine plus the 200 that followed the first) stacked turtles, and does a header into the waters of his pond. It is on the last page that we learn that the pond is actually quite shallow, while the sediment beneath the water is very deep. With over 5,000 turtles residing in one tiny half-acre pond, the sediment *would* indeed be very deep. But the good Dr. Seuss does not yield any details about the exact composition of the bio-rich ingredients of that which lies under the waters of King Yertle's pond. He chooses the all-encompassing word "mud" to describe it. He disdainfully ends the book by crowning Yertle "King of the Mud."

§§§§§

Just after reading about Yertle, I fell into a trance-like state, and had a vision. Theodore Seuss Geisel—AKA Dr. Seuss himself—appeared to me in said vision. "Teddy," as he wished to be addressed, was *not* a happy camper, and complained bitterly about Woke educators rallying against several of his books. They did not like the way he portrayed Asian and African American folk, and put the kabong on reprinting six of his books as a result. But what he was *really* pissed about was what the prudish folk did to his "Yertle the Turtle" story. The full story was cut in half, and they even made him change the title.

What Teddy told me was that his Yertle treatise was actually the result of years of research into the origins of a genus best generally described as Mud Turtles. Teddy didn't mess around. He did not merely want to trace the lineage of the stinky things in a general way, he wanted to find the *very first Mud Turtle* ***ever*****!** His drive and motivation even carried him to the fabled island of Sala-ma-sond, where he learned the legend of Yertle the Turtle. (Truth be told, the island of Sala-ma-sond—though exotic in name—is not all that distant. It turns out that it's an island in a tributary of the Mississippi River, located about 45 minutes southeast of Thibodaux, Louisiana.) The whole story of Yertle was so complicated that the ingenious Teddy decided to make an amusing children's cartoon book of it all, so that people of all ages could understand and enjoy it. But he was shot down right at the point where King Yertle hit the mud of his pond after his plunge from above the moon. Yertle became at that moment, the "King of Mud." It's what happened ***after*** that—the *real* creation story of mud turtles—that got axed by a very conservative 1950s publishing company.

In a nutshell, what was censored went something like this:

King Yertle *loved* living in the mud so much that he made it his domain. He successfully seduced and copulated with many female softshell turtles, the occasional unwary red-eared slider, and as many box turtles of both sexes that he could overpower. (King Yertle was a bit of a randy rascal.) As a result of his shameless multi-species debauchery, he became patriarch to a new chelonian master race. In some places, they are moss-backed bottom feeders, who muck about in turtle, frog, carp and catfish shit. In other places, they are high-climbing fools, who think nothing of going a hundred feet straight up the face of a near-vertical cliff. They've been known to climb trees as well. (Thanks to genetics, and aptitude, Yertle was a strong climber, and he spread that climbing gene far and wide with his many deviant sexual escapades). Wherever they are found—be it a pond, a swamp, or a *tinaja* in a dry gulch—they are *all* called mud turtles. And Yertle the Turtle was the prototype of the lot of them.

But of all that Teddy lost, the changing of his book title crushed him the most. The narrow-minded conservatives of the late 1950s simply would not accept "The Adventures of Yertle the Fertile Turtle" as the title for his book. Upon telling me this, the forlorn author just sort of dissipated from view, in much the same fashion as Scotty might have beamed him away. I figure this vision swept over me for three reasons: 1. I read the book, 2. became that there "complete person" that Don promised as a result, and 3. maybe ate a few too many gummies that day?

This here is Roger Repp, signing off from Southern Arizona, where the turtles smell strong, the snakes are handsome, and the lizards are above average.

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Mexican Geographical Distribution Notes 12: First Records from the State of Colima for the Invasive *Eleutherodactylus planirostris* (Anura: Eleutherodactylidae)

Christoph I. Grünwald [1,2,3]*, Alberto Pérez-Alcalá [4] and Carlos Montaño-Ruvalcaba [2,3]

Abstract

We report the first record of the invasive *Eleutherodactylus planirostris* from the state of Colima. This species is a highly invasive anuran which is endemic to the West Indies, but has been widely introduced by humans. This is the first record of this species on the Pacific versant of Mexico, and we discuss potential conservation issues pertaining to native *Eleutherodactylus* in the area.

Keywords: conservation; greenhouse frog; introduced species; Pacific versant

Introduction

Eleutherodactylus planirostris is a highly adaptable species native to Cuba, Bahamas and the Caiman Islands (Diaz and Cadiz, 2008; Olson and Beard, 2012). It has been widely introduced in various parts of the world, including the United States (Florida, Louisiana, Alabama, Mississippi, South Carolina, Texas, Hawaii), Central America (Panama, Honduras, El Salvador), Mexico, Philippines, Hong Kong and elsewhere (Frost, 2023).

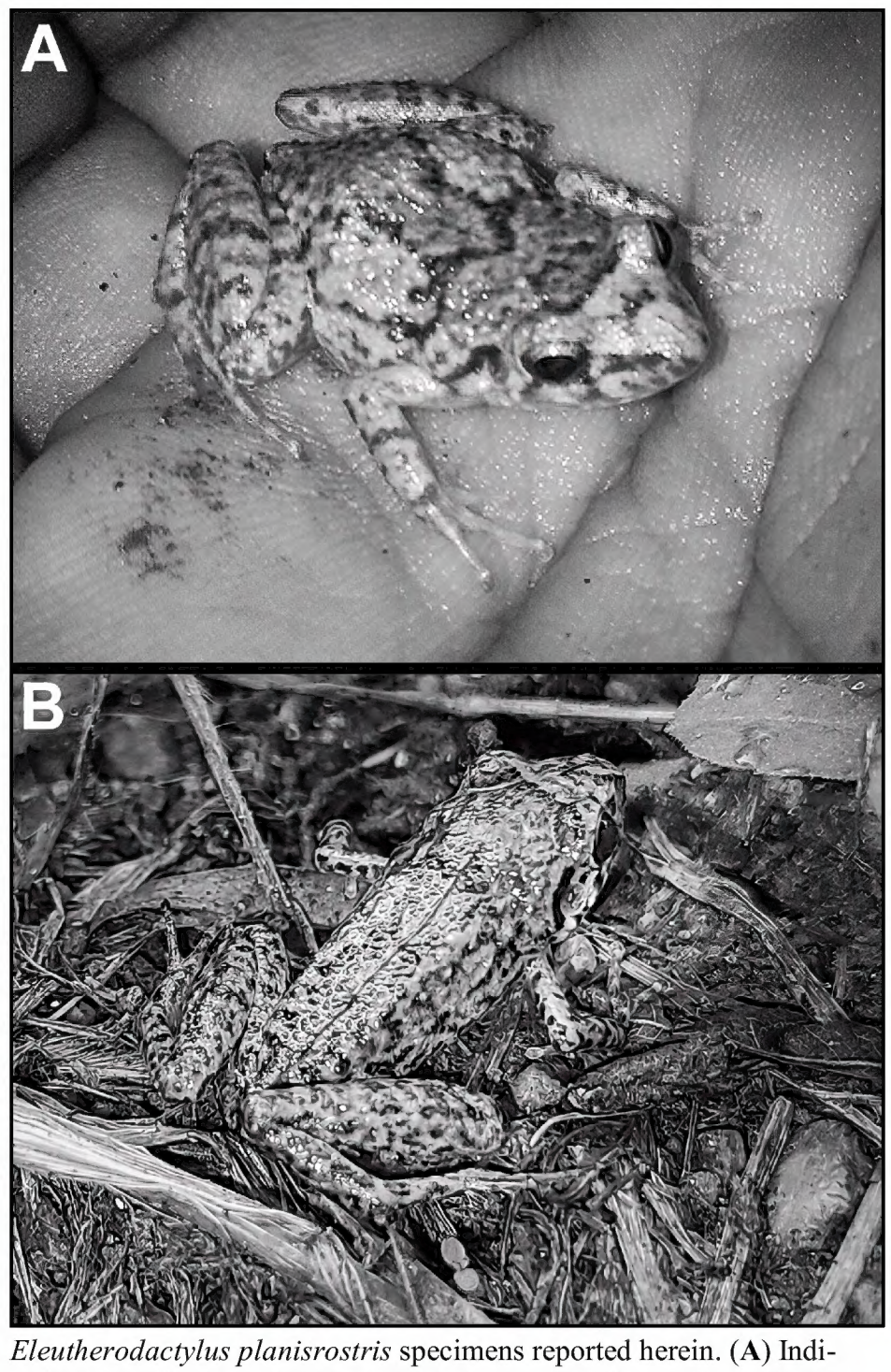
In Mexico it was first reported from Veracruz by Schwartz (1974). Recently, it has been recorded from numerous localities in the states bordering the Gulf of Mexico and Caribbean, including Veracruz (Schwartz, 1974; Contreras-Calvario et al., 2018; García-Vinalay et al., 2020; Vázquez-Cruz et al., 2023); Tabasco (Barragán-Vázquez et al., 2022); Campeche (Ortiz-Medina et al., 2021); Yucatan (Ortiz-Medina et al., 2017; Bojórquez-Acevedo et al., 2018); and Quintana Roo (Cedeño-Vázquez et al., 2014; Pavón-Vázquez et al., 2016; García-Balderas et al., 2016; Gómez-Salazar and Cedeño-Vázquez, 2017; Cedeño-Vázquez and Beutelspacher-García, 2019). However this species has not been reported from the Pacific versant of Mexico. We report herein the first records for the state of Colima, which also represent the first reports from the Pacific versant of Mexico.

Distribution Records

MEXICO: Colima: Municipio de Manzanillo: along Avenida Manzanillo in Jardines de Santiago, in Santiago, Manzanillo (19.126225°N, 104.338982°W; WGS84; 14 m elev.) 24 November 2021. Alberto Pérez-Alcalá. Photo vouchers of this individual were deposited in the University of Texas Arlington, Digital Collection (UTADC 9962), https://www.inaturalist.com/observations/101915637; along Avenida Manzanillo in the Nuevo Salahua neighborhood, in Salahua, Manzanillo (19.116716°N, 104.341261°W; WGS84; 11 m elev.) 09 October 2023. Alberto Pérez-Alcalá. Photo vouchers of this individual were deposited in the University of Texas Arlington, Digital Collection (UTADC 9963a–d), https://www.inaturalist.com/observations/186849474. Identifications of both individuals were verified by Dr. Javier Ortíz-Medina.

Discussion

These are the first records for the state of Colima, and represent an introduced population. Two specimens were photographed, but many were seen on both occasions. The fact that numerous specimens have turned up repeatedly over two years



Eleutherodactylus planisrostris specimens reported herein. (**A**) Individual from Jardines de Santiago, Municipio de Manzanillo, Colima (UTADC 9962). (**B**) Individual from Nuevo Salahua, Municipio de Manzanillo, Colima (UTADC 9963). Photographs by Alberto Pérez-Alcalá.

1. Biencom Real Estate, Carretera Chapala–Jocotepec #57-1, C.P. 45920, Ajijic, Jalisco, Mexico.

2. Biodiversa A.C., Avenida de la Ribera #203, C.P. 45900, Chapala, Jalisco, Mexico.

3. Herp.mx A.C. C.P. 28989, Villa de Álvarez, Colima, Mexico.

4 Universidad de Colima, Delegación Manzanillo. Carretera Manzanillo–Cihuatlán km 20.5, C.P. 28860, Manzanillo, Colima, Mexico.

in the same area suggests that this population is established. Furthermore, several other observations have been published from the Manzanillo metropolitan area on the online platform Naturalista.mx (GBIF, 2023). These records are important not only because they are the first records from the state of Colima, but because this is the first time that this species is recorded from the Pacific versant of Mexico. While the invasive populations in the Caribbean and Gulf versants of Mexico mostly live in areas devoid of native *Eleutherodactylus*, Manzanillo differs in having two native species within the city limits (*E. modestus* and *E. orarius*). While both of these species are relatively common, *E. planirostris* will undoubtedly have a negative effect on these native *Eleutherodactylus* populations.

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Confirmation of the Presence of the Invasive Stump-toed Gecko, *Gehyra mutilata* (Wiegmann, 1834) (Squamata: Gekkonidae), in the State of Veracruz, Mexico

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Introduction

The Stump-toed Gecko, *Gehyra mutilata* (Wiegmann, 1834) (Squamata: Gekkonidae), is a species native to the Indo-Malayan region (Fisher, 1997), introduced in Mexico. This species is an effective colonizer, usually associated with human buildings (Barragán-Ramírez et al., 2015). In Mexico, its distribution is not well known and there are inconsistencies in the specialized literature, but it has been reported in the states of Baja California Sur, Sinaloa, Nayarit, Jalisco, Colima, Guerrero, Oaxaca, Chiapas, Veracruz, Yucatán and San Luis Potosí (e.g., Reynoso, 1990; Ponce-Campos and Huerta-Ortega, 2001; Quijada-Mascareñas and Canseco-Márquez, 2007; Lemos-Espinal and Dixon, 2013; Reyes-Velasco et al., 2020; González-Sánchez et al., 2021). Molecular studies by Fisher (1997) and by Rocha et al. (2009) have indicated that there are two lineages within *G. mutilata*. These analyses did not include specimens from Mexico; for this reason, we will consider the records within Mexico as *G. mutilata sensu lato*. Recently, González-Sánchez et al. (2021) provided a map of the distribution of *G. mutilata* in Mexico and briefly discussed the range, but did not provide precise localities or information on the specimens, to which we add inconsistencies between the information in the text and the map presented for *Gehyra mutilata* (e.g., Baja California Sur, Yucatán and Veracruz). The presence of *G. mutilata* in Veracruz was mentioned by Álvarez-Romero et al. (2008) based on a record they say was reported by Peters and Donoso-Barros (1986); however, the species is not mentioned by those authors. Additionally, it was not included in the recently revised checklist of the herpetofauna of Veracruz (Torres-Hernández et al., 2021). Therefore, the presence of *G. mutilata* in Veracruz has not been confirmed until now. Here, we report the first verified record for *G. mutilata* from the state of Veracruz, Mexico (Figure 1). Additionally, Figure 1 includes the Mexican records available in scientific collections from the GBIF platform (Global Biodiversity Information Facility, <https://www.gbif.org>).

Distribution Record

On 14 June 2021, at approximately 21:00 h, we found a juvenile *G. mutilata* on a concrete pillar near the train tracks close by the old railway station in the municipality of Fortín de las Flores, a casual observation during fieldwork in an amphibian project in the center-west of the state of Veracruz, Mexico (18.90168°N; 97.0001°W; WGS 84; 1010 masl; Figure 2). It had a snout–vent length of 25 mm and total length of 47 mm. We deposited a digital photographic voucher at the Natural History Museum of Los Angeles County (LACM PC 2902) and the voucher specimen in the Instituto Tecnológico Superior de Zongolica (ITSZ-R-262). We identified *Gehyra mutilata* based on two diagnostic characters: uniform and smooth scales on dorsum; tail with no tubercles and somewhat denticulate (Taylor, 1963; Uetz, 2023).

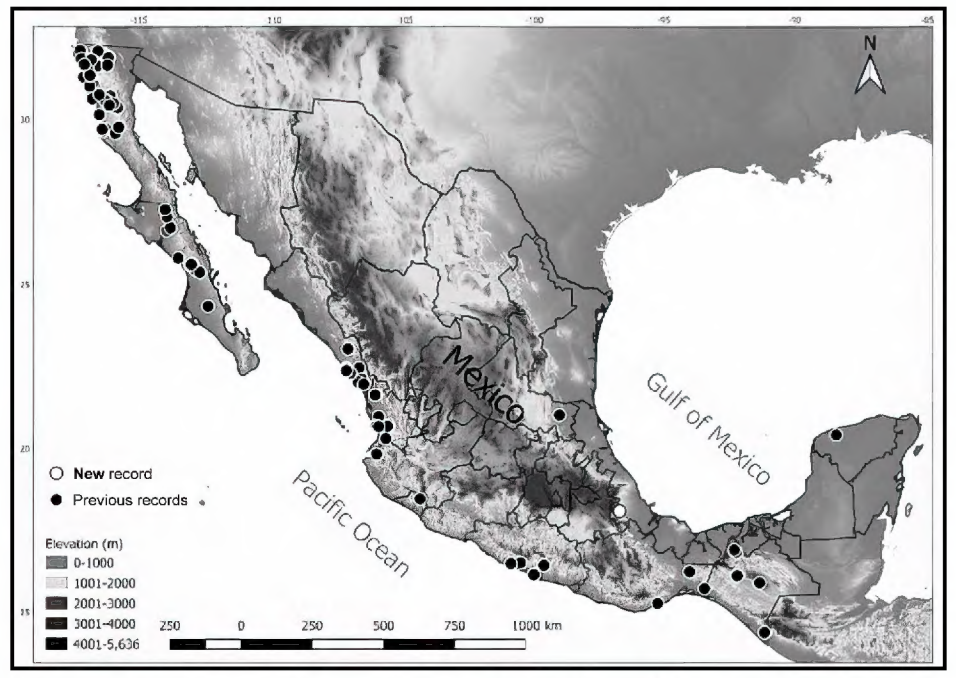

Figure 1. *Gehyra mutilata* collection localities in Mexico.

Discussion

This record is located 331 km north of the closest previously known record in the municipality of Santa Maria Chimalapa (MZFC 4740-1 to MZFC 4740-6; Global Biodiversity Information Facility https://www.gbif.org), in the state of Oaxaca. It is worth mentioning that there is an additional citizen observation for the species from Veracruz in the iNaturalist platform (https://www.naturalista.mx/observations/84377588). However, the photograph that supports this observation does not allow us to determine if it really is *Gehyra mutilata* or some species of the genus *Hemidactylus* (Squamata: Gekkonidae). According to Torres-Hernández et al. (2021) in the state of Veracruz, three

Figure 2. A juvenile specimen of *Gehyra mutilata* (LACM PC 2902; ITSZ-R-262) from the municipality of Fortín de las Flores, Veracruz, Mexico.

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species of introduced geckos similar to *G. mutilata* are found: *Hemidactylus frenatus* Duméril & Bibron, 1836, *Hemidactylus turcicus* (Linnaeus, 1758) and *Hemidactylus mabouia* (Moreau De Jonnès, 1818). We can distinguish *G. mutilata* from the species of the genus *Hemidactylus* by the lack of enlarged dorsal scales and by the slightly denticulated tail (Taylor, 1963; for comparisions see photographs within Baldo et al., 2008; Martínez-Hernández et al., 2017; Vásquez-Restrepo and Lapwong, 2018).

Although several studies on herpetofauna have been carried out in the region (e.g., Solano-Zavaleta et al., 2017; de la Torre-Loranca et al., 2020; Vásquez-Cruz, Olivares-Blanco et al., 2021), the published records of introduced herpetofauna are recent: *Eleutherodactylus planirostris* (Contreras-Calvario et al., 2018; Vásquez-Cruz., García-Vinalay et al., 2020), *Anolis sagrei* (Venerozo-Tlazalo et al., 2017; Vásquez-Cruz, Reynoso-Martínez, Fuentes-Moreno et al., 2020; Vásquez-Cruz, Reynoso-Martínez, González-Galindo et al., 2021), *Indotyphops braminus* (Vásquez-Cruz, Reynoso-Martínez, Fuentes-Moreno et al., 2021) and *Hemidactylus frenatus* (Vázquez-Cisneros, 2006; Vásquez-Cruz, Reynoso-Martínez, Kelly-Hernández et al., 2020). We consider as a probable cause what was mentioned by Vásquez-Restrepo and Lapwong (2018)—that the introduced taxa were unfamiliar to researchers and therefore were not published. Most of these records have occurred within large cities or in localities of agricultural production, where the transportation of materials or plants may represent the main method of dispersal of these species. It is necessary to carry out sampling on the site and in adjoining localities that allow knowing the colonization and possible distribution of the species, as well as its possible impact on native species. Additionally, we consider necessary a detailed review of the localities reported for *Gehyra mutilata* in Mexico, perhaps by state, to clarify the current distribution of this species in the country.

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Notes on the Herpetofauna of Mexico 44: Predation by a Coachwhip (*Masticophis flagellum*) on a Mohave Rattlesnake (*Crotalus scutulatus*) in the municipality of Hidalgo del Parral, Chihuahua, Mexico

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Abstract

We document predation on a Mojave Rattlesnake (*Crotalus scutulatus*) by a Coachwhip (*Masticophis flagellum*) in a walnut plantation in the municipality of Hidalgo del Parral, Chihuahua, Mexico.

Resumen

Aquí documentamos la depredación de una serpiente de cascabel de Mojave (*Crotalus scutulatus*) por parte de un chirrionera (*Masticophis flagellum*) en una plantación de nogal en el municipio de Hidalgo del Parral, Chihuahua.

Monitoring flora and fauna throughout the state is one of the main activities regularly carried out by the staff members of the Laboratorio de Biodiversidad, Instituto de Ciencias Biomédicas, of the Universidad Autonóma de Juarez in the municipality of Juárez, Chihuahua. We also receive the help of former students who work in different institutions through the state and keep a close eye on herpetological activity.

While conducting a survey throughout a walnut plantation (27.12568724°N; 105.62482831°W, elevation 1543 masl) on 20 September 2023 at 14:01, we observed a *Masticophis flagellum* consuming a live *Crotalus scutulatus*. When we began to observe the event, the coachwhip had consumed most of its prey. Our observation lasted just 5 minutes, then the snake proceeded with its daily activity. This event occurred in the northern portion of the walnut plantation where there is a xerophytic scrub vegetation community. The stream was dry and the temperature was 35°C. Unfortunately, no other data were taken on either of the snakes.

Coachwhip (*Masticophis flagellum*) feeding on a Mohave rattlesnake (*Crotalus scutulatus*). Photograph by Rubén Fernando Alvidrez-Heredia.

Background on the predator: *Masticophis flagellum* (Shaw, 1802)

Vernacular names and distribution

Masticophis flagellum is known by several English and Spanish vernacular names, depending on the locality. In English it is called coachwhip or whipsnake. In Spanish it may be called *chicotera*, *chirrionera*, *chirrionera verde*, *chirrionera roja*, *chirrionera pinta*, *serpiente látigo*, *limpiadora de campo*, *coimaj*, *coopol* or *cmasol*. This snake's distribution extends across the southern half of the United States and thence into Mexico south through Baja California, west of the Sierra Madre Occidental to southern Sinaloa and east of the Sierra Madre Oriental to northern Jalisco and Queretaro (Ortenburger, 1928; Wilson, 1973a, b; Tennant and Bartlett, 2000; Werler and Dixon, 2000; Stebbins, 2003; Lemos-Espinal et al., 2015; Heimes, 2016; Lemos-Espinal et al., 2017; Gatica-Colima et al., in press). The range encompasses all of the northernmost states of Mexico.

General description

The body of this elongate, widely-distributed snake is variable in color and ranges by geography from light brown, dark

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A typical coachwhip (*Masticophis flagellum*). Photographed in Hudspeth County, Texas, by Vicente Mata Silva.

brown, brick red or pink, and sometimes even with dark bands. The belly is light cream, red, or pink, often with darker margins on the scales of the color of the body. The tail is similarly patterned. The head is the same color as the body. The scales on the lips, neck, and throat, when light red or pink, may have irregular spots. The scales are smooth, the dorsals grouped in 17 diagonal rows on the middle of the body. The cloacal scute is divided. The pupil is round. (Lazcano et al., 2010; Heimes, 2016; Lemos-Espinal et al., 2015).

Activity and diet

The coachwhip is non-venomous, with aglyphous dentition. This snake is large and in Mexico occurs in relatively dry habitats, is diurnal and very active. It has a high metabolic rate, and so it requires body temperatures ranging from 33 to 37°C to stay active (Lazcano et al., 2010; Heimes, 2016; Lemos-Espinal et al., 2015). But nocturnal activity has also been documented in New Mexico by Gross et al. (2014). The coachwhip uses rodent burrows and cracks in rocks as shelter and can be very aggressive when approached or handled. The diet of *Masticophis flagellum* includes insects (possibly in the snake's juvenile stage), lizards, snakes, small turtles, birds, bird eggs, and small mammals, such as rodents. The size of the prey varies as the snake grows. The species has been documented by Hamilton and Pollack (1956) to include in its diet the ring-necked snake (*Diadophis punctatus*) and the eastern hog-nosed snake (*Heterodon platirhinos*). Mueller and Whiting (1989) watched a *Masticophis flagellum* preying on a rough greensnake (*Opheodrys aestivus*). They observed a lengthy predator-prey interaction, stretching nearly 4 hours from when the encounter was first observed until the prey was completely swallowed. Small et al. (1994) observed the consumption of a glossy snake (*Arizona elegans*) by a coachwhip. Tabor and Germano (1997) reported finding two additional food items for the species. In one instance, the snake was observed pursuing a desert iguana (*Dipsosaurus dorsalis*) that was not eaten. The other instance involved a DOR specimen in which they found the remains of a northern Pacific rattlesnake (*Crotalus oreganus*). LaBonte (2001), while conducting a long-term radio-tracking telemetry study on a population of *Phrynosoma coronatum*, found that one of their specimens had been preyed on by a *Masticophis flagellum*. Beaman and Harris (2002) and Duncan (2003) documented the consumption of gopher snakes (*Pituophis catenifer*). LaDuc and LaDuc (2003) documented cannibalistic feeding in a DOR specimen of the species. Amarello et al. (2004) reported finding this species preying on a juvenile Agassiz's desert tortoise (*Gopherus agassizii*), which, however, was regurgitated still alive by the snake. Ryberg and Dayton (2004) documented the possible predation of this species on populations of Couch's Spadefoot (*Scaphiopus couchii*) in areas of sympatry. Additional food items of the species are shown in Table 1. Back in 1997 in a DOR specimen on the road from Ciudad Victoria to Llera de Canales, Tamaulipas, the author (DL) found several specimens of Texas spotted whiptail (*Aspidoscelis gularis*) in its stomach contents, but this finding was never documented; the species was later documented as prey by Buford et al. (2018). The anti-predator behavior known as death-feigning has been observed in *Masticophis flagellum* (Smith, 1975; Tucker, 1989; Repp, 2001).

On the other hand, *M. flagellum* may also be preyed upon by

Table 1. Specific herpetological prey items identified in the diet of *Masticophis flagellum*.

Prey	State	References
Crotalus adamanteus (Eastern Diamond-backed Rattlesnake)	Mississippi	Hinderliter and Lee, 2006
Conopsis nasus (Large-nosed Earth Snake)	Aguascalientes	Avila-Villegas et al., 2007
Phrynosoma modestum (Round-tailed Horned Lizard)	New Mexico	Sherbrooke, 2010
Trimorphodon lambda (Sonoran Lyresnake)	Nevada	Beaman and Basey, 2011
Caretta caretta (Loggerhead Sea Turtle) *Lepidochelys kempii* (Kemp's Ridley Sea Turtle) *Eretmochelys imbricata* (Hawksbill Sea Turtle)	Florida	Arpayoglou and Martin, 2011
Crotalus ruber (Red Diamond Rattlesnake)	California	Beaman et al., 2014
Pituophis melanoleucus melanoleucus (Northern Pinesnake)	North Carolina	Beane, 2014
Crotalus helleri (Southern Pacific Rattlesnake)	California	Myers and Myers, 2014
Gopherus polyphemus (Gopher Tortoise)	Georgia	Stevenson, 2014
Aspidoscelis inornata (Little Striped Whiptail)	Texas	Graham and Kelehear, 2015
Heterodon sp. (unspecified Hog-nosed Snake) *Heterodon nasicus* (Western Hog-nosed Snake)	New Mexico	Beauchamp and Rochford, 2018
Aspidoscelis gularis (Texas Spotted Whiptail) *Bogertophis subocularis* (Trans-Pecos Ratsnake)	Texas	Buford et al., 2018

other snake species. Swannack and Forstner (2003), while measuring a Texas coralsnake (*Micrurus tener*), saw it regurgitate a coachwhip. A similar occurrence has been observed in our locality, but not documented. In another event involving a coralsnake, Enge and Mays (2016) documented that the harlequin coralsnake (*Micrurus fulvius*) includes *M. flagellum* in its diet.

Reproduction and size

The coachwhip is oviparous. The eggs are laid from April to September. The clutch can range in size from 4 to 20 eggs, depending on the size and weight of the female. Reproduction of the species in Arizona was documented by Goldberg (2002). The maximal total length for the species is 2600 mm, but in Mexico it rarely exceeds 2000 mm (Lazcano et al., 2010; Heimes, 2016; Lemos-Espinal et al., 2015).

Habitat and conservation status

The state of Chihuahua is divided into two main physiographic regions, Sierras y Llanuras del Norte (with four subprovinces: Llanuras y Médanos del Norte; Sierras Plegadas del Norte; Del Bolsón de Mapimi; Llanuras y Sierras Volcánicas), and Sierra Madre Occidental (with five subprovinces: Sierras y Cañadas del Norte; Sierras y Llanuras Tarahumaras; Gran Mesetas y Cañones Chihuahuenses; Sierras y Llanuras de Durango; Gran Mesetas y Cañadas Duranguenses). *Masticophis flagellum* is not endemic to the state of Chihuahua nor to the country of Mexico; however, the species had been found in all nine of the above-listed subprovinces (Gatica-Colima et al., in press). Altitudinal gradient for the species is from near sea level to around 2500 masl (Lazcano et al., 2010; Heimes, 2016; Lemos-Espinal et al., 2015).

The IUCN Red List conservation status for *Masticophis flagellum* is Least Concern (IUCN, 2023) and its EVS (*sensu* Wilson et al., 2013) is 8, placing it in the low vulnerability category. This species (as *Coluber flagellum*) is placed in the threatened category (A) by SEMARNAT (2010). There are many sites on the internet that give excellent information on the species. One such is <https://animaldiversity.org/accounts/Masticophis_flagellum/>.

Background on the prey: *Crotalus scutulatus* (Kennicott, 1861)

Vernacular names and distribution

Common names vary depending on the locality: In English, Mohave (or Mojave) rattlesnake, Mojave green rattlesnake. In Spanish, *chiauhcóatl* (note: the Náhuatl meaning = female rattlesnake), *víbora de cascabel* (Campbell and Lamar, 2004), *cascabel de pradera* (Liner and Casas-Andreu, 2008).

General distribution in the United States is from the Mojave Desert of southeastern California, through southern Nevada, and southeastward to west Texas. The general distribution in Mexico is in the Chihuahuan Desert, extending to Sonora, and southward to Guanajuato, Puebla, and southeastern Veracruz. It is distributed in an altitudinal gradient that extends from sea level to 2500 meters above sea level. (Stebbins, 2003; Lemos-Espinal et al., 2015; Heimes, 2016; Gatica-Colima et al., in press).

General description

The background color ranges from light to dark brown. The

A typical Mohave rattlesnake (*Crotalus scutulatus*). Photographed in Hudspeth County, Texas, by Vicente Mata Silva.

pattern consists of a series of 27 to 44 spots, in the form of well-defined brown diamonds, each bordered by a dark-colored line and in turn by another light-colored line that joins the ends of the spots. On the sides of the body are positioned irregularly shaped spots the color of the dorsal spots. The belly is light cream or white, and sometimes has patches of color at the margins of the light lines that come out behind and in front of the eye and reach the supralabial scales. Coloration and pattern are very similar to that of *C. atrox*. This species can be distinguished from other rattlesnakes by features of color pattern and scalation, and especially by the presence of enlarged plates (scutes) on the head, located between the eyes (Degenhardt et al., 1996). The tail is white, with thin black stripes or rings. The head is wider at the base than at the front and of the same color as the body, with small spots the color of those on the back. The pattern also features a couple of lines on the sides of the head, one coming out behind the eye and reaching the base of the mouth and another that comes out in front of the eye to the middle of the mouth. A deep facial pit is positioned between the eye and nostril. The dorsal scales are strongly keeled, grouped in 21 to 29 diagonal rows at midbody. The cloacal scute is not divided. The pupil is vertical. (Lemos-Espinal et al., 2015; Heimes, 2016).

Activity and diet

Crotalus scutulatus is highly venomous; dentition is solenoglyphous. In addition to the cytotoxic elements in its venom, a considerable part of the venom is of the neurotoxic type, which affects the central nervous system, causing cardiac and respiratory paralysis, as well as muscular paralysis. This group of toxins is much faster acting than cytotoxins. This snake is considered one of the most venomous rattlesnakes in the Mexico. *Crotalus scutulatus* is primarily nocturnal, but it also can be active during the day at moderate temperatures. This snake is very aggressive. When it feels threatened, it positions itself to attack, throwing itself forward trying to bite.

Crotalus scutulatus primarily preys on mammals, but several other types of prey have been reported. Reynolds and Scott (1982) found mammals in 91.7% of the stomachs of the Chihuahua specimens examined that contained food items, including kangaroo rats in 39.6%, pocket mice in 20.8%, white-footed mice in 16.5%, ground squirrels in 10.4%, jackrabbits in 4.2%,

and cottontails in 2.1%. Klauber (1972) found mammal remains in 21 specimens of *C. s. scutulatus*, but lizard remains in only two, and mammal remains in two *C. s. salvini*. Prey is selected on the basis of size, and that which either is too large or too small is rejected. In addition, potential prey that possibly could harm the snake is not accepted (Reynolds and Scott, 1982). Both live prey and carrion are consumed (Ernst and Ernst, 1992). Known natural prey include mammals (kangaroo rats [*Dipodomys merriami*, *D. paramintinus*, *D. spectabilis*], pocket mice [*Perognathus flavus*, *P. intermedius*, *P. longimembris*, *P. pencillatus*], white-footed mice [*Peromyscus eremicus*, *P. maniculatus*], ground squirrels [*Ammospermophilus leucurus*, *Spermophilus spilosoma*, *S. tereticaudus*], and hares and rabbits [*Lepus californicus*, *Sylvilagus audubonii*]); bird eggs; reptiles, including lizards (*Coleonyx brevis*, *Aspidoscelis tigris*, *Holbrookia* sp., *Phrynosoma platyrhinos*, *Sceloporus* sp., *Uta stansburiana*) and snakes (*Phyllorhynchus decurtatus*); amphibians (toads [*Anaxyrus* sp.], spadefoots [*Scaphiopus* sp., *Spea* sp.] and frogs). This snake also consumes centipedes and insects (Boone, 1937; Huey, 1942; Kauffeld, 1943; Johnson et al., 1948; Dammann, 1961; Klauber, 1972; Parker, 1974; Reynolds, 1978; Cromwell, 1982; Reynolds and Scott, 1982; Tennant, 1984; Lowe et al., 1986; Ernst and Ernst, 1992; Brown, 1997; Plummer, 2000; Cardwell, 2005, 2006). In addition, captive individuals have consumed brown rats (*Rattus norvegicus*), house mice (*Mus musculus*), woodrats (*Neotoma albigula*), lizards (*Anolis carolinensis*, *Plestiodon fasciatus*, *Holbrookia* sp., *Uta stansburiana*) and a snake (*Crotalus cerastes*). (Vorhies and Taylor, 1940; Klauber, 1972; Brown and Lillywhite, 1992; Strimple, 1993). Brennan and Holycross (2006) mentioned that this species feeds on birds, but did not provide additional information. Peña-Peniche et al. (2017) reported predation on the grasshopper sparrow (*Ammodramus savannarum*), which is now included in its diet for Mexico. Although the English common name derives from the Mojave Desert in California, most of its range lies in Mexico. Recently, Cardwell (2013) undertook a study in which he found that this snake changes its behavior in response to times of drought in the Mojave Desert, which helps it survive during periods of extensive drought.

Reproduction and size

This species of rattlesnake, as with all rattlesnakes, is viviparous. The number of offspring, which are born between the months of July and August, varies between 5 and 13. At birth, the siblings measure 204 to 221 mm. The size of the litter depends on the size, age, and locality of the individuals in the population. Total length can reach 1290 mm. (Lemos-Espinal et al., 2015; Heimes, 2016).

Habitat and conservation status

Chihuahua is divided into two main physiographic regions: 1) Sierras y Llanuras del Norte and 2) Sierra Madre Occidental. *Crotalus scutulatus* inhabits all four subprovinces of the first region (Llanuras y Médanos del Norte, Sierras Plegadas del Norte, Del Bolsón de Mapimi, and Llanuras y Sierras Volcánicas), and three of five subprovinces of the second region (Sierras y Cañadas del Norte, Sierras y Llanuras Tarahumaras, and Sierras y Llanuras de Durango). This snake generally prefers grasslands or places with dense vegetation and abundant mammal burrows, which can serve as a refuge. *Crotalus scutulatus* is not found in rocky places or places with sparse vegetation; however, it can be found in thickets and oak and pine-oak forests. The IUCN Red List conservation status for *Crotalus scutulatus* is Least Concern (IUCN, 2023) and its EVS (*sensu* Wilson et al., 2013) is 11, placing it in the medium vulnerability category. This species has special protection (Pr) by SEMARNAT (2010).

Human impact on the species

As with most Mexican rattlesnakes, *C. scutulatus* is included in the trafficking activity in many local markets for meat consumption and traditional medicine throughout Mexico. The greatest threats facing *C. scutulatus* in northern Mexico are habitat destruction, use as traditional medicine and food, and the trade in live animals or their skins (Lavín-Murcio and Lazcano, 2010). Many populations of herpetofaunal species are suffering from altered habitats, due to anthropogenic activities including deforestation for ranching purposes, mining, road travel, provoked forest fires, and many more (Nevárez-de los Reyes et al., 2016; SEMARNAT, 2018; Lazcano et al., 2019). Illegal trafficking of flora and fauna is an enormous problem in Mexico and the world at large. This activity merits the highest punishment, because it adversely affects biodiversity (Méndez and Olivera, 2022). Many people are involved in this illegal activity, not understanding that what they are trafficking has thousands to millions of years of evolution behind it.

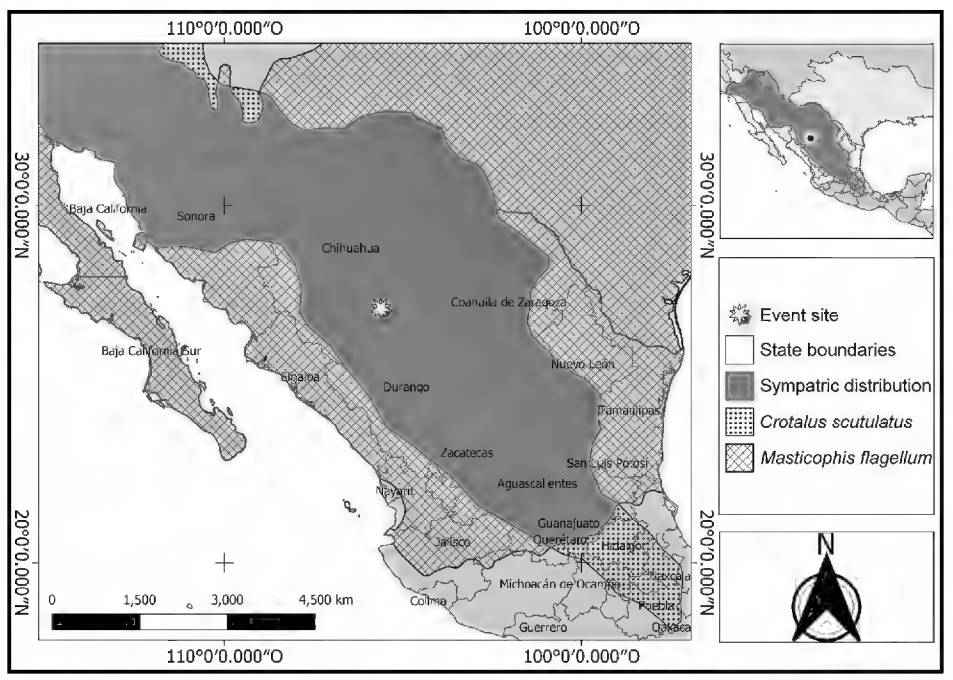
Background on the state and municipality

Chihuahua is the largest state in Mexico. It encompasses 245,612 km^2 and lies between 25°38'N to the south, 31°47'N to the north, and between 103°18'W to the east, and 109°7'W to the west. It represents 12.6% of the territory of the nation. Chihuahua is physiographically complex and this complexity affects the distribution of the herpetofauna in the state.

The municipality of Hidalgo del Parral has a area of 1,863 km^2 and represents 0.71% of the area of the state. It is located in the southern part of the state and in a transitional zone between the Chihuahuan Desert and the Sierra Madre Occidental.

Background on the study site

The study site lies in the northern portion of the municipality of Hidalgo del Parral. The location is a walnut plantation called



Potential distribution and area of sympatry for *Crotalus scutulatus* and *Masticophis flagellum* in Chihuahua, Mexico. Map created by Edgar Emmanuel Hernández-Juárez.

Xerophytic scrub vegetation at the study site. Photograph by Rubén Fernando Alvidrez-Heredia.

Low stature microphyllous scrub vegetation at the study site. Photograph by Rubén Fernando Alvidrez-Heredia.

Rancho "Los Tecolotes." The area that is not under cultivation is composed of two vegetation types. One type is xerophytic scrub vegetation with populations of *Larrea tridentata*, which is a very common species and perhaps the dominant species. Also present is low stature microphyllous scrub, which is inhabited by the following plants: mesquite (*Prosopis* sp.), huizache (*Vachellia* sp.), and catclaw mimosa (*Mimosa aculeaticarpa*) in undisturbed settings. The area of the walnut tree plantation is bordered by a stream (arroyo) where the dominant plant species are mulefat (*Baccharis salicifolia*) and Spanish needle (*Bidens bipinnata*). Also present are the cacti walking stick cholla (*Cylindropuntia imbricata*), blue barrel cactus (*Echinocactus horizonthalonius*), and redeye prickly pear (*Opuntia macrocentra*) (Rzedowski, 2006).

The stream in the area has natural runoff and only has water intermittently during rainy periods. Rancho "Los Tecolotes" has undergone land use modifications through the years involving conversion from xerophytic scrubland to irrigation plots for the planting of corn, oats and walnuts.

Discussion and conclusions

It is incredibly challenging to study the natural feeding habits of any snakes. Snakes are very secretive and rarely observed in the wild, and they feed relatively infrequently, making observations of feeding difficult. As a result, scientific understanding of snake dietary ecology (beyond simple prey lists) remains remarkably superficial except for a few species (Maritz et al., 2019). Ophiophagy is a common feeding behavior in many genera of snakes, such as *Agkistrodon, Atractaspis, Cylindrophis, Drymarchon, Lampropeltis, Malpolon, Micrurus* and *Ophiophagus* (Martínez Freiría et al., 2006; Greene, 1997; Jackson et al., 2004; Safaei-Mahroo et al., 2017). Incidentally, *Malpolon*, a rear-fanged Old World genus, is very similar to *Masticophis* in its behavior. Jackson et al. (2004) studied the mechanism of ophiophagous behavior in the California kingsnake.

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UPCOMING MEETINGS

Monthly meetings of the Chicago Herpetological Society begin at 2:00 P.M. on the third Sunday of each month. Please try to join us online or *in person* at the Notebaert Nature Museum, 2430 N. Cannon Drive, Chicago. The next meeting will take place on March 17. CHS member **Ali Baghdadi** of Ali's Reptile Den will provide an in-person educational show featuring live animals.

At the April 21 meeting **Boris Berlijn** of The Amphibian Foundation <www.amphibianfoundation.org> will deliver a virtual presentation.

Please check the CHS website or Facebook page each month for information on the program. Information about attending a Zoom webinar can be found here:
<https://support.zoom.us/hc/en-us/articles/115004954946-Joining-and-participating-in-a-webinar-attendee->

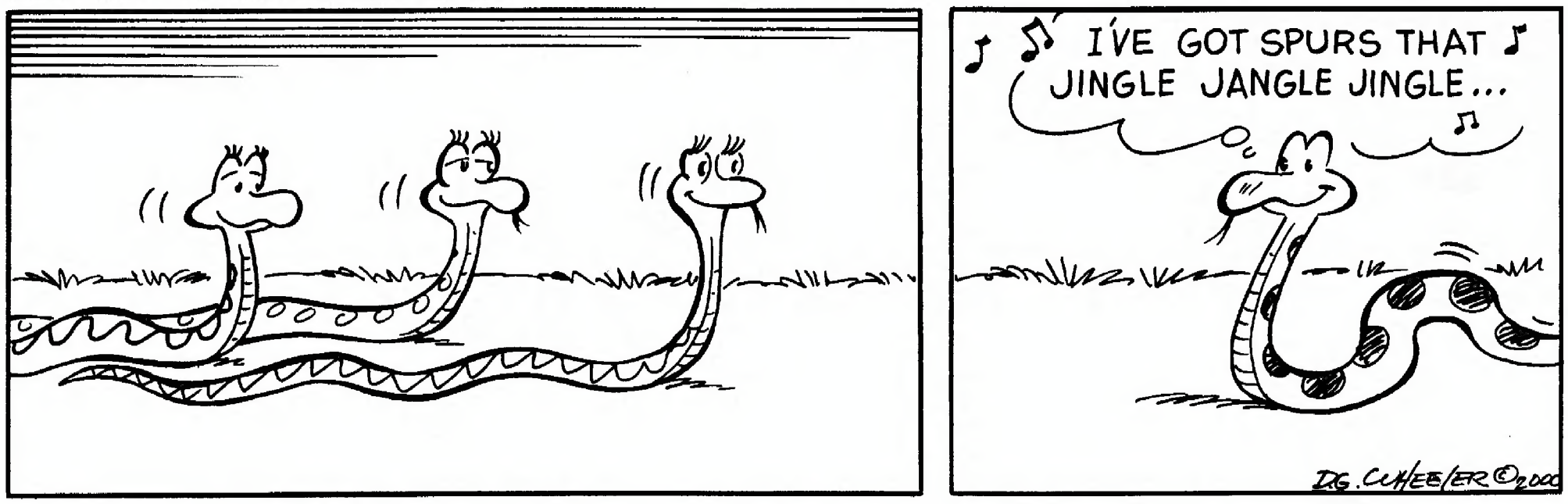
Board of Directors Meeting

Are you interested in how the decisions are made that determine how the Chicago Herpetological Society runs? And would you like to have input into those decisions? The next board meeting will be held online. If you wish to take part, please email: rcrowley@chicagoherp.org.

NEW CHS MEMBERS THIS MONTH

Lily Barajas
Matthew Campbell
Lola Gibb
Thomas Hiley

THE ADVENTURES OF SPOT



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